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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,926	01/13/2002	Steven Teig	SPLX.P0085	3333
23349	7590	11/10/2004	EXAMINER	
STATTLER JOHANSEN & ADELI			SIEK, VUTHE	
P O BOX 51860			ART UNIT	
PALO ALTO, CA 94303			PAPER NUMBER	
			2825	

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/046,926

Applicant(s)

TEIG ET AL.

Examiner

Vuthe Siek

Art Unit

2825



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-15, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-15, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to application 10/046,926 and amendment filed on 8/26/2004. Claims 6-15 and 21-22 remain pending in the application.
2. The indicated allowability of claims 6-15 and 21-22 are withdrawn in view of the newly discovered reference(s) to Das et al.. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 6-12 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Das et al., "Channel Routing in Manhattan-Diagonal Model," IEEE, 1995, pp. 43-48.
5. As to claims 6, 8, 21 and 22, Das et al. teach a method of defining routes for nets in a region of circuit layout, wherein each net has a set of pins (pages 43-47) by dividing an IC design into sub-regions, where the sub-regions including pins for interconnecting between logic elements within the sub-regions comprising a) using a first set of lines to measure length of the routes (Manhattan grid or diagonal grid, Fig. 1); b) using a second set of lines to measure congestion of routes (segment wires of Manhattan grid or diagonal grid, Figs. 1-12); c) using a third set of lines to partition the region into a first set of sub-regions (Manhattan grid or diagonal grid are used to divide a region into

Art Unit: 2825

plurality of sub-regions, Fig. 1); and for each net, identifying a route that traverses a group of first-set sub-regions that contain the net's set of pins (Das et al. describes in his article routing in Manhattan-Diagonal model having terminals, vias or pins in sub-regions, Figs. 1-12).

6. As to claim 7, Fig. 1 shows the second set and third sets of lines are identical (Manhattan or diagonal grids).

7. As to claims 9-12, Das et al. teach measuring the length of each route by summing the length of each route segments in the route's set of route segments (Das et al. teach routing in Manhattan and diagonal models using Manhattan and diagonal grids, thus each route can be measured by summing the lengths of each route segment using Manhattan and diagonal models (Figs. 1-12); using the second set of lines comprising measuring the congestion of routes across the second set of lines (congestion of routes can be measured across Manhattan or diagonal wire segments; Figs. 1-12); the second set of lines define a plurality of congestion edges, wherein measuring the congestion of the routes comprising measuring the congestion of routes across the congestion edges (congestion of routes can be measured across Manhattan or diagonal wire segments; Figs. 1-12); once a route is completed, specifying each route only with respect to the route's segments that cross the congestion edges (Figs. 1-12); identifying the route for each net comprising starting at a first-set sub-region that contains a pin of the net, successively specifying a route segment that expands the route into a new first-set sub.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being obvious over Das et al., "Channel Routing in Manhattan-Diagonal Model," IEEE, 1995, pp. 43-48.

10. As to claims 13-15, Das et al. teach routing using Manhattan-Diagonal model within Manhattan and diagonal grids, where Manhattan and diagonal set of lines divide an IC design region into sub-regions, and where the routing starts to connect a route of nets from starting pin to destination pins. It is noted that pins are located within the sub-regions. Accordingly, the routing would expand the route from one sub-region to other sub-regions until a routing of nets is complete. Das et al. teach a goal of the routing of nets between sub-regions is to minimize routing length, minimizing via count by taking consideration of routing congestion (Figs. 1-12, see entire document). It is noticed that routing cost and congestion cost are well known in an IC design layout that are used as metric function to minimizing routing length in order to meet design requirements. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to compute a length cost and a congestion cost because these computed costs would be used as metric to minimize routing length and minimize via count in order to meet design requirements (timing delay and areas).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vuthe Siek whose telephone number is (571) 272-1906. The examiner can normally be reached on Increase Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vuthe Siek


VUTHE SIEK
PRIMARY EXAMINER